



Institutionalized governance processes Comparing environmental problem solving in China and the United States[☆]

Oran R. Young^{a,*}, Dan Guttman^{b,c}, Ye Qi^d, Kris Bachus^e, David Belis^e, Hongguang Cheng^f,
Alvin Lin^g, Jeremy Schreifels^h, Sarah Van Eynde^e, Yahua Wang^d, Liang Wuⁱ, Yilong Yan^d,
An Yu^d, Durwood Zaelke^j, Bing Zhang^k, Shiqiu Zhang^l, Xiaofan Zhao^d, Xufeng Zhu^d

^a Bren School of Environmental Science and Management, University of California (Santa Barbara), Santa Barbara, CA, USA

^b Whiting School of Engineering, Johns Hopkins University, Baltimore, MD, USA

^c Center for US–China Relations, Tsinghua University, Beijing, China

^d School of Public Policy and Management, Tsinghua University, Beijing, China

^e Leuven International and European Studies, Leuven University, Leuven, Belgium

^f School of Environment, Beijing Normal University, Beijing, China

^g Natural Resources Defense Council, Beijing, China

^h School of Environment, Tsinghua University, Beijing, China

ⁱ School of Humanities and Social Sciences, Beijing Forestry University, Beijing, China

^j Institute for Governance & Sustainable Development, Washington, DC, USA

^k School of the Environment, Nanjing University, Nanjing, China

^l School of the Environment, Peking University, Beijing, China

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ABSTRACT

Both China and the US have developed distinct governance processes to address environmental issues. The dominant processes of environmental governance in China take the form of (i) many laws but state planning is dominant and (ii) intermediate crisis scanning procedures and policy responses on an irregular or episodic basis outside the confines of the Five-Year Plans or other national plans. The parallel processes in the US involve (i) law-centered practices including the enactment of legislation, the promulgation of regulations, and the judgments of courts and (ii) federalism/multi-level governance featuring initiatives/innovations at national and sub-national levels of government and policy diffusion. These institutionalized governance processes are more deeply embedded in the political and social systems of the two countries than the range of factors commonly considered in discussions of policy instruments. Both sets of institutionalized governance processes produce successes in addressing environmental problems under some conditions and failures under others. But the determinants of success in the two systems are not the same, and there is no reason to expect the two systems to converge during the foreseeable future. The analysis of environmental problem solving in China and the US illustrates the power of the general idea of institutionalized governance processes as a basis for research on comparative politics in a wide range of settings.

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1. Introduction

In this article, we argue that China and the United States have developed distinct processes to fulfill needs for governance and

that these *institutionalized governance processes* constitute the core of the system operating in each country to address environmental issues. While China has many environmental laws, state planning constitutes the key process in environmental governance. The US, by contrast, relies first and foremost on a set of law-centered processes. Both systems are rooted in the historical experiences and cultural practices of their respective societies. Both produce successes under some conditions and failures under others, though their track records to date are not strictly comparable. But the determinants of success in the two systems are not the same; the implications for the selection of specific policy instruments are different, and common

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* Corresponding author at: Bren School of Environmental Science and Management, University of California (Santa Barbara), 4518 Bren Hall, Santa Barbara, CA 93106-5131, USA. Tel.: +1 805 284 3386; fax: +1 805 893 7612.

E-mail address: oran.young@gmail.com (O.R. Young).

prescriptions (e.g. promotion of the western ideal of the “rule of law”) do not translate easily from one system to the other.

Governance is a matter of finding collective solutions to problems that involve multiple actors and that are too complex to be solved by individuals, like-minded groups of individuals, or non-state actors (e.g. corporations). The study of governance centers on identifying the processes that societies develop and use to tackle such problems (e.g. securing public safety, encouraging economic growth, combating air pollution); analyzing the conditions that determine whether these processes produce successes or failures in addressing specific problems, and exploring options for improving the performance of governance processes.

We focus on environmental problems and the governance processes that China and the United States have developed to address these problems. Though both societies have long traditions of dealing with the management of natural resources and responding promptly to natural disasters, the emergence of the environment as a distinct policy domain is a relatively recent development in both countries, dating from the passage of the National Environmental Policy Act (NEPA) of 1969 in the US and from the 1979 preliminary version of the basic Environmental Law in China. Today, environmental problems have become matters of considerable importance and even urgency in both countries. We endeavor to use our analysis of environmental governance in the two countries to provide a broader assessment of the usefulness of the concept of institutionalized governance processes in comparing efforts to address a variety of problems arising in distinct sociopolitical settings.

Environmental problems occur in every era and in all societies. But the scale of the problems arising today is unprecedented. China and the US are the two essential countries when it comes to addressing the most profound environmental problems of our times. In the case of climate change, for example, the two countries account for over 40% of current emissions of carbon dioxide ([Global Carbon Project, 2014](#)). No effort to solve the problem of climate change can succeed without the active engagement of these countries. Vigorous leadership on the part of America and China might well prove sufficient to generate the momentum needed to make the changes required to solve this problem. This makes the November 2014 agreement between Presidents Obama and Xi on measures to curtail greenhouse gas (GHG) emissions a particularly important step in the realm of environmental governance.

While all societies must find ways to tackle environmental problems, there is no reason to suppose that the resultant processes will be the same or even similar from one society to another ([Steinberg and VanDeveer, 2012](#); [Duit, 2014](#)). On the contrary, we expect distinct processes to develop in individual societies that dominate efforts to identify/frame environmental problems, establish their priority in policy arenas, and determine the nature of the steps taken to solve them ([Ostrom, 2005](#)). Our central hypothesis is that the dominant processes that China and the US have developed to address environmental problems differ in fundamental ways. These processes are institutionalized in the sense that they are rooted in and reflect longstanding political, legal, organizational, and cultural characteristics of the two societies. Understanding these differences can facilitate efforts to achieve comparable levels of effort, thereby providing a basis for strengthening measures designed to address transboundary and global problems.

In today's globalized world, both policymakers and analysts sometimes find it expedient to use similar terminology in comparing governance processes operating in different countries and in evaluating their results. This practice often leads to confusion rather than to clarity regarding the defining features and the performance of governance systems in specific countries. Nowhere is this complication more apparent than in the case of

the processes of environmental governance in China and the US. We therefore make a concerted effort to use key terms precisely or to introduce new terms where this is necessary to avoid confusion.

2. The challenge of environmental governance

Environmental governance and governance in other issue domains (e.g. national security, macroeconomics, or health, education, and welfare) belong to the same broad universe of cases. Yet environmental problems and the processes societies develop to address them have several distinctive characteristics that have important implications for thinking about the performance of environmental governance systems.

Solving environmental problems typically requires an effort to modify, redirect, or even suppress conduct on the part of actors ranging from individuals to powerful (private or state-owned) enterprises whose actions reflect interests that are entrenched and that are deemed socially desirable in many contexts. Think of competition among enterprises for market share in a properly functioning market system as a case in point.

Within governments, moreover, environment ministries/agencies routinely have mandates that bump up against or conflict with the efforts of other agencies to pursue missions aimed at maximizing economic growth, delivering health care, constructing transportation systems, and so forth. If, as is often the case, environment ministries are weak relative to other ministries in political terms, the challenge of altering the conduct of (private and public) actors who can count on the support of stronger government agencies becomes particularly daunting.

3. Institutionalized processes of environmental governance

In seeking to identify distinctive governance processes, we recognize that a good deal of variation exists within each system so that simple generalizations are hazardous. Yet it is possible to identify dominant processes that evolve over time, are embedded in broader social systems, and are brought to bear repeatedly in efforts to address specific environmental problems. Our discussion of institutionalized governance processes constitutes an initial formulation; it is intended to encourage further study and comparison. Nevertheless, we are convinced that there are institutionalized environmental governance processes in place in China and the US and that these processes differ profoundly.

We argue that each system features three institutionalized processes, two dominant processes involving government as the central force and a third less developed process in which shifting perceptions, attitudes, and values on the part of the public (or within civil society) are central. In the two dominant processes, actions on the part of governmental entities (including the courts in the case of the US and the communist party in the case of China) play the central role in solving environmental problems. In the third process, actions occurring outside of governments are central, either in the form of the diffusion of new social norms (e.g. the growing acceptance of same-sex couples in America) or in the form of coordinated behavior on the part of sizable groups of people (e.g. the gentrification of urban cores in many cities, the rise and fall in the popularity of sport utility vehicles). Although such third processes have played some role regarding environmental issues in both societies, we argue that they are (currently) subordinate to the dominant processes in the two countries and that they are generally regarded as less important in addressing environmental problems than they are in addressing problems arising in other issue domains (e.g. civil and human rights).

The dominant processes of environmental governance in China, we argue, take the form of (i) many laws but state planning in

various forms and at several levels is dominant and (ii) crisis scanning procedures and policy responses on an irregular or episodic basis outside the confines of the Five-Year Plans (FYPs) or other national plans.

The parallel processes in the US involve (i) law-centered practices including the enactment of legislation, the promulgation of regulations, and the judgments of courts regarding controversies about the application of these measures in specific situations and (ii) federalism/multi-level governance featuring initiatives/innovations at national and sub-national levels of government and policy diffusion.

4. Dominant Chinese environmental governance processes

4.1. Many laws but state planning is dominant

China is a unitary or centralized state, with formal authority residing at the top. The country has millennia of experience with the efforts of central governments to manage a vast area characterized by considerable geographic and cultural diversity. In reality, relations between the central government and local governments in China are far more complex than the concept of a unitary state might suggest. Central design may be followed by local implementation including creative competition, but also by local resistance whether in the form of seeming defiance of the center or invidious competition among local governments. Still, the central government plays the leading role in efforts to solve environmental problems.

The central government – a combination of the main organs of the ruling party, the State Council, and the National People's Congress – is responsible for articulating policies and developing nationwide plans. Adopted on a trial basis in 1979 and formalized in 1989, the Environmental Protection Law of the People's Republic of China articulates a general commitment to maintaining environmental quality and calls for the development of standards, procedures dealing with environmental impact assessment, monitoring systems, and penalties for violations (Environmental Protection Law, 1989). Since then, China has enacted numerous environmental laws addressing specific environmental issues as well as a variety of environment-related laws. Nevertheless, when it comes to devising substantive measures addressing environmental problems and especially dealing with matters of implementation, state planning plays the dominant role in environmental governance in China.

At the center of this planning process are the nationwide FYPs that set forth overall goals, establish priorities in cases where tradeoffs among goals are necessary, and spell out more specific targets (*mu biao*) on a synoptic but time-limited basis. The five-year cycle of each FYP begins with the release of the national Five-Year Plan for Social and Economic Development at the annual joint meeting of the National People's Congress and Chinese People's Political Consultative Conference in March of the first year of the plan period. The key targets articulated in the FYP increasingly include mandatory environmental and energy targets, such as pollutant [sulfur dioxide (SO₂), nitrogen oxides (NO_x), chemical oxygen demand (COD)] reduction targets, non-fossil energy targets, and energy and carbon intensity reduction targets (Xinhuanet, 2011). The central government assigns implementation of the targets to lower levels of government through agreements (*zeren shu*) including performance measures. The plans address the allocation of resources among targets, assign responsibility for meeting the targets to lower levels of government, introduce innovations in procedures used to promote effective implementation, and provide criteria for evaluating the performance of governance (Qi, 2014; Yan, 2013; Schreifels et al., 2012; Guttman and Song, 2007). While they do not take the form of

laws in the western sense, the State Committee and the National People's Congress adopt the plans formally, endowing them the authority of formal actions of China's political institutions.

Following release of the overall Five-Year Plan for Social and Economic Development by the central government, individual ministries and local governments develop more focused FYPs on the specific governance areas under their purview, such as the Ministry of Environmental Protection's (MEP) 12th Five-Year Plan on Environmental Protection released in November 2011 (State Council, 2011) and the National Development and Reform Commission's (NDRC) 12th Five-Year Plan on Energy Development released in January 2013 (State Council, 2013).

Planning in China is a complex process involving many players and resulting in the adoption of FYPs supplemented as needed by national plans dealing with specific problems (e.g. PM 2.5) and a variety of local plans addressing more limited issues (Song and Guttman, 2007). The NDRC, generally regarded as the most powerful civilian agency in the central government, plays a key role in assembling and drafting the FYPs, which are then vetted by the State Council and adopted formally by the National People's Congress as “legally binding” or “effective” acts of government (*fa lu xiao li*). Because the FYPs are based on guidelines provided by the Central Committee of the Communist Party of China (CPC), they also reflect the views of the leadership of the CPC. As a result, they have the support of the dominant political institutions in Chinese society.

The goals, targets, and formulas for resource allocation embedded in the FYPs may reflect the personal views of powerful leaders, the preferences of major interest groups, influential theories about economic development, assessments of what is needed to maintain the stability of the system, the ideas of prominent scientists, responses to rising public pressures, and so forth. But whatever the origins of provisions of the FYPs, these plans have the support of the leaders of both the party and the formal institutions of government.

Moving the plans from paper to practice is challenging even in a unitary state (Qi and Wu, 2013). The central government, which is relatively small as measured by the size of the civil service (Guttman et al., 2013) proceeds to set targets for provincial governments, which in turn set targets for lower level governments. The Target Responsibility System has evolved to exert pressure on lower-level officials to make a concerted effort to fulfill the goals of the central plans (Li et al., 2013). Along with other similar innovations, this has improved performance. But like implementation in all political systems, a variety of competing forces including personal ambition and the effects of corruption can impede or even block progress toward meeting the targets set by the plans.

The plans also provide a basis for a variety of mechanisms designed to energize implementation efforts. Thus, the plans (i) set forth targets in operational terms (e.g. a 20% reduction in energy intensity) to serve as benchmarks for assessing progress, (ii) rationalize the allocation of resources (e.g. subsidies) to those charged with meeting the targets, (iii) lead to the development of performance agreements to enhance the incentives of officials at various levels, (iv) provide a basis for organizing pilot projects, and (v) often become a focus of continued leadership attention.

In China, as in the US, there are legal procedures for resolving conflicts between laws. China's Law on Laws (*li fa fa*) provides for reconciliation of conflicts by the State Council or the National People's Congress in contrast to the American practice of relying on the judgments of courts. But “plans” are not defined as “laws” in the Law on Laws, though the FYPs and other major plans are adopted by the National People's Congress and are therefore backed by the authority of the government. In principle, a plan must be consistent with the laws. In implementation, however, inconsistency and even conflict are not uncommon, reflecting the

reality that the laws are sometimes marginalized or ignored by those responsible for implementing the provisions of the plans and meeting specific targets. As Deng Xiaoping argued in a 1978 speech that remains well-known today: “[v]ery often, what leaders say is taken as the law and anyone who disagrees is called a law-breaker” (Deng, 1978).

In China, plans (or other central government directives) are enabled by the unitary system, which embraces not only nationwide government but also nationwide public personnel procedures. Plans and their targets may serve as criteria for assessing the achievements of individual office holders. Targets set in central plans are both to be followed by local governments and used in periodic performance reviews that lead to promotion decisions. Plans are typically time limited (e.g., operating for three or five years or perhaps longer) and roughly correspond to leadership tenures (at the highest level, now two five year terms). Incoming leaders often play key roles in framing the terms of the FYP they will inherit upon assuming office.

In form and in relation to what we treat as a defining characteristic of environmental governance in China, planning integrates environmental concerns with other, potentially competing, priorities. The FYPs include numerous targets, with environmental goals increasingly joining economic goals as “veto targets” or targets that must be met by those seeking promotion. In the process of drafting the plan, the NDRC consults with other agencies and other levels of government. In the economic growth vs. environmental quality context, “win/win” is a persistent planning theme (e.g. support of the renewable energy industry). This gives rise to the synoptic Chinese planning process in contrast to the more piecemeal American lawmaking process where environmental laws typically do not address economic development directly (though of course they often have indirect economic effects).

To illustrate concretely the process of state planning in China, consider the case of efforts to reduce emissions of SO₂. Both the 10th FYP (2001–2005) and the 11th FYP (2006–2010) set targets for reductions in SO₂ emissions. But the results were strikingly different. Emissions in 2005 were 28% above 2000 levels. By contrast, emissions in 2010 were 14% below 2005 levels. What accounts for this striking turnaround in the results of state planning from one planning period to the next? There is no simple answer to this question. But analysts have identified a number of key factors underlying success in the later period, including stronger leadership support; better coordination between the NDRC and the MEP; a focus on a smaller number of environmental goals; innovation regarding policy instruments; improved procedures for monitoring, reporting, and verification, and better enforcement (Schreifels et al., 2012). An interesting debate centers on the extent to which the turnaround between the 10th and 11th FYPs constitutes evidence of the strengths of the planning process or is simply attributable to ad hoc considerations (e.g. a focus on “low hanging fruit” within the capacity of existing technology whose adoption could be financed and overseen by government resources). The resolution of this debate has important implications for efforts to meet the ambitious targets for reductions in PM 2.5 articulated in the September 2013 Air Pollution Prevention and Control Action Plan conceived in response to air pollution crises in Beijing and other cities as well as for the goal announced in the November 2014 China-US Climate Agreement of reaching peak emissions of carbon dioxide around 2030.

4.2. Crisis scanning and policy responses beyond regular central plans

Many have noted that the success of governments in China over millennia has depended on their capacity to prepare for and deal with unpredictable but recurrent natural crises – floods,

earthquakes, famines – as well as with analogous social or political crises from within and without. What makes for success in this process is an ability to identify disruptive events in a timely manner and to devise direct responses to them that ease the tension and allow the system to remain resilient.

Crises are partially subjective. Some natural disasters are treated as relatively routine events that do not require exceptional responses on the part of the government. But when an occurrence (e.g. the 2007 algal bloom in Lake Tai or the drying up of the Yellow River in the 1990s) is widely reported as a shocking event, it can quickly take on crisis proportions. Governments may even encourage such interpretations as a means of legitimizing strong policy measures. With regard to the environment, China faces continued challenges on many fronts. These include events with immediate impact, such as oil or chemical spills that cause fish deaths or crop failure and necessitate the use of bottled water. They also include developments, such as local noise pollution (from construction or traffic or street life) that may not amount to crises in the ordinary sense, but are continued sources of vociferous citizen complaints. In addition, these challenges include threats, such as soil deterioration, deforestation, and limits on water availability, that may be beyond the daily awareness of most urban citizens but pose severe longer term threats. They also include developments that pose long term and latent risks but that, with social media and increased environmental awareness, may present themselves as immediate causes of alarm. Current examples include PM 2.5 air pollution, a chronic problem punctuated by severe pollution episodes. The PM 2.5 problem now affects citizens’ daily conduct as well as the development of proposals for the construction of chemical or waste treatment plants, which have become a source of local protests.

Such events occur in America as well. But from the point of view of environmental governance, these events and the processes involved in responding to them play a distinctive role in China. In China, the government is understood to be the primary and default institution with responsibility for both anticipating (scanning the environment for) crises and responding to them. In the US, the understanding is that this role is shared among the Federal government, subnational governments, markets (including the insurance industry), and civil society. There is an assumption that civil society (sometimes referred to as the “voluntary” or “third” sector) plays a watchdog role in anticipating crises and devising means to address them as well as a mediating role in addressing them. In China today, the concept of a campaign (*yundong*) is also in use but most often in association with efforts by leaders to focus the attention of lower level government officials and citizens on a problem.

In the US, the initiation of a law process is typically the primary form of crisis response. Thus, US environmental disasters (e.g. the burning of the Cuyahoga River, the discovery of hazardous wastes in the Love Canal, or the gas leak at Union Carbide’s plant in Bhopal) are recalled in significant part because of their association with the enactment of laws to address them and prevent the recurrence of similar environmental problems.

China has developed a repertoire of tools and practices to deal with such problems during the intervals between the development of one FYP and the next (Zhou et al., 2013; Zhang and Barr, 2013). One common practice is to compensate victims of crises for their personal losses without altering broader priorities articulated in the FYPs. Other measures include the development of more focused plans (e.g. the Overall Plan on Comprehensive Management of Water Environment in the Lake Tai Watershed developed in the wake of the 2007 crisis; the 2013 Air Pollution Prevention and Control Action Plan) or the launching of experiments with new policy instruments (e.g. the regulations designed to reduce traffic congestion in Beijing). In some cases, the government has

introduced quantitative caps on specific activities or the use of certain resources (Greenhalgh, 2008). A recent example is the adoption of a national cap on the consumption of coal as a response to the crisis of air pollution in major cities (symbolized by public concern about PM 2.5) which will expand upon existing caps on coal consumption in key air pollution regions and provinces such as the Beijing–Tianjin–Hebei area, the Yangtze River Delta area around Shanghai, and the Pearl River Delta in the industrialized southern part of Guangdong Province.

What all these practices have in common is that they are ad hoc responses on the part of the government to irregular crises that flair into matters of intense public concern and that are judged to require immediate attention. Prompt responses are required in cases like the 2007 algal bloom in Lake Tai, the 2008 Sichuan earthquake, the great ice storm of 2008, and the 2011 oil spill in Bohai Bay. An ability to address such incidents successfully is essential to the effectiveness of governance in China, even though the solutions found are often not suitable for inclusion in the regular FYPs.

As a concrete example of the second dominant Chinese process, consider the PM 2.5 crisis. In 2008, in the run-up to the Beijing Olympics, domestic and international press frequently published articles about the potential impact of air quality on the Olympics, and the US Embassy in Beijing introduced a system for monitoring and publicizing levels of fine particulates in the air known as PM 2.5. Circulated initially among staff members of the Embassy, these data were later published on social media. The public began to question the discrepancies between the US Embassy's qualitative characterization of ambient PM 2.5 levels (e.g. "hazardous") and Beijing's qualitative description of air quality (e.g., "blue sky"). Since then, public concern about the health effects of air pollution in major Chinese cities has risen exponentially. In January and February 2013, the Air Quality Index in a number of cities in northern China, including Beijing, reached extreme and unprecedented levels. Public reaction to the expected health impacts of PM 2.5 erupted into a problem of crisis proportions. In an effort to respond to this crisis, the State Council commissioned the MEP to take the lead in drafting an Air Pollution Prevention and Control Action Plan (MEP, 2013). Released by the State Council in September 2013, the plan sets concrete PM 2.5 and PM 10 reduction targets for 2017 for key air pollution regions and the rest of China, respectively; targets a variety of pollution sources, including coal-fired power plants and industrial boilers, vehicles, and construction activities; promotes rebalancing of China's industrial and energy structure, and urges strengthening of mechanisms such as pollution monitoring and disclosure, enforcement of laws, and regional air pollution coordination. This initiative constitutes a prominent example of China's crisis response governance process. But it remains to be seen whether this plan developed quickly in response to a severe crisis and not backed by the full authority of the FYP can change the behavior of local officials and enterprises who previously allowed air pollution to grow unchecked and whether efforts to address the PM 2.5 problem will be integrated into the next FYP.

5. Dominant American environmental governance processes

5.1. Law-centered practices involving legislation, regulation, and judicial judgments

In the US, law-related activities are central to the treatment of environmental problems. If a problem arises, the first question is: "Is there a law?" If there is a law: "How well does it work?" If it does not work well: "Can we fix it or pass a new law?" Law-centered processes have several variants involving the enactment of legislation, the use of the executive's regulatory authority, and

the judgments of courts. Such processes may be initiated from within government. But they may also arise from outside the government through the initiatives of citizens (or NGOs or enterprises) (Fiorino, 1995).

In the American common law tradition, citizens have used centuries old concepts to seek court relief from problems that have yet to be addressed by legislation or regulations. The common law concept of tort, including nuisance (itself borrowed from Roman law), was critical to the early development of American environmental law and environmental governance. Another example centers on what is known as the public trust doctrine under which courts have ruled that government agencies have an inalienable responsibility to protect water bodies, such as lakes and rivers, and coastal resources, such as shellfish beds and wetlands (Sax, 1970; McCay, 1998).

Beginning with the enactment of NEPA in 1969, and continuing with clean air and water laws, the Superfund legislation addressing hazardous waste sites, and laws dealing with toxic releases, legislation became the core of the modern American environmental governance process (Mazmanian and Kraft, 2009). The implementation of this legislation involves specialized agencies, such as the Environmental Protection Agency, the Forest Service, the National Oceanic and Atmospheric Administration, and the Department of Energy as well as state-level counterparts, which promulgate regulations designed to move the provisions of laws from paper to practice and take action as needed to enforce the regulations. The US Administrative Procedure Act of 1946 and state counterparts set forth the procedures agencies must follow in developing implementing regulations, including provisions for public participation in the development of the regulations as well as the right of citizens and organizations to go to court to challenge agency fidelity to the legislation (Percival et al., 2009). Although these laws were not immediately effective in solving environmental problems, they have provided points of departure to be strengthened progressively through formal amendments and innovative practices at the administrative level.

To help enforce US laws, the Department of Justice started to upgrade the enforcement capabilities of its Lands and Natural Resources Division (now called the Environment and Natural Resources Division) in the 1970s, adding several new sections including one on hazardous waste enforcement and another on wildlife enforcement. During the same period, "citizen suit" provisions were added to most environmental laws under which citizens can go to court to sue polluters directly when the government fails to act. The citizen suit provision is important as a means both of complementing government resources and of enhancing the prospect of compliance and law enforcement where, for whatever reason, government agencies are not willing to act against polluters who are violating the law.

This law-centered process differs from the state planning process in China in several important respects. Whereas China's FYPs are synoptic, American laws address environmental problems on their own terms without endeavoring to integrate measures with policies in other issue domains (e.g. industrial policy). On the other hand, whereas China's FYPs are time-limited (each FYP will be superseded by a new plan at the end of five years), American laws are intended to remain in force indefinitely. State planning of the type practiced in China is politically infeasible in the United States. This means that efforts to address environmental problems like air pollution or water pollution must proceed on a self-contained basis. There is no mechanism for establishing priorities across the broader policy agenda or addressing tradeoffs among goals in a given time period.

Administrations change in the US, and those responsible for specific problems can hope that a new administration will take office that is less interested in enforcing existing laws. But laws

remain in force over time, even though new administrations may seek to weaken them. Of course, there is also the prospect that a later administration will seek to strengthen laws or decide to increase the attention devoted to implementing existing laws. Administrative agencies (e.g. EPA) will continue to make an effort to implement laws, even when they are not matters of priority to top-level policymakers. And actors in civil society can bring suits in courts, regardless of the preferences of an incumbent administration.

The effectiveness of law-centered processes in solving environmental problems depends on the ability of Congress to enact legislation, the stringency of legislation that Congress enacts, the capacity of government agencies to implement the provisions of legislation, the willingness of Congress to provide adequate funding, and the willingness of the courts to make rulings in cases of controversy that are favorable to the cause of environmental protection. As experience with legislation enacted in the 1970s, subsequent amendments, and regulatory actions makes clear, this process can produce striking successes in addressing environmental problems. Since enactment of the Clean Air Act, for example, emissions of key criteria pollutants have declined more than 70%, while the American economy has experienced considerable growth.

But there is no guarantee that the American law-centered process of environmental governance will prove effective. When political polarization leads to congressional gridlock or the judges appointed to the federal courts (especially the federal appeals courts and the Supreme Court) become less friendly to environmental causes, the results may be far less satisfactory from the perspective of environmental problem solving.

A striking example of the operation of this governance process centers on the Clean Air Act Amendments of 1990 (Bryner, 1995). One of the hardest fought environmental battles of the 1980s in the US dealt with the impacts of acid rain on human health, freshwater lakes, forests, and even the built environment. The battle pitted the Northeast against the Midwest and coal producers against residents of impacted areas. Scientific consensus regarding the effects of acid rain was elusive. But political pressure to take action mounted steadily. In November 1990, President Bush signed the Clean Air Act Amendments of 1990, which the House of Representatives had passed by a vote of 401–21 and the Senate by a vote of 89–11. The legislation called for a 50% reduction in emissions of SO₂, the principal precursor of acid rain, and introduced an innovative cap-and-trade system to achieve this goal. Focusing on the power sector, the 1990 amendments require this sector as a whole to maintain emissions below a mass-based limit that does not adjust for growth in output. Each coal-fired power plant must have a continuous monitoring system that meets EPA's performance specifications to account for every ton of SO₂ emitted. This case is regarded widely as one of America's most successful environmental initiatives. But the generalizability of this experience to other environmental issues is far from clear.

5.2. Federalism/multi-level governance

Whereas China has a unitary state, the United States has a federal political system. Under the terms of the American Constitution, all powers not assigned to the Federal government remain with the states (US Constitution, 10th Amendment, 1791). And under state constitutions, local governments retain authority over functions like public order, education, and land use planning and zoning.

Reality is more complex than this simple statement implies. Just as the ability of the central government to control what happens in the provinces is a longstanding issue in China, relations among levels of government is an enduring theme of American political history. In the 20th century, both authority and resources

generally flowed to the Federal government. Spurred by the influence of progressivism, the need to fight large-scale wars, and the crisis of the Great Depression, the Federal government became a dominant force in governance in America. Starting in the 1980s, however, Republican administrations have pushed the pendulum back in the other direction, a development now promoted by the Tea Party and various libertarian groups.

Yet this is not the whole story. There is considerable variation among state and local governments. Many of them have developed distinctive approaches to a variety of issues, including the treatment of environmental problems. This situation emerges as a particularly important feature of American politics during periods like the present in which the Federal government is hobbled by the effects of polarization, despite the emergence of increasingly severe problems (Rabe, 2004).

With regard to environmental governance, an important theme has been whether leaving states to their own devices will lead to a "race to the top" or a "race to the bottom." Will states compete for economic development by strengthening environmental laws or by watering them down or avoiding them altogether? In the early 20th century, reformers talked about states as "laboratories of democracy" and promoted the idea that innovations tried out in individual states could, upon success, be emulated at the national level. When mid-20th century environmentalism emerged in the 1960s, it was during the height of the civil rights movement in which Washington was called on to address state and local refusals to honor basic rights. The key environmental laws of the late 20th century were federal laws. States were given implementation roles, but subject to strict federal oversight augmented by the efforts of public interest advocacy groups acting as watchdogs. In recent years, the state/federal balance has been changing again. In the context of leadership roles assumed by California and other states along with cities like Portland, Oregon and faced with congressional resistance to climate change legislation, the pendulum has swung to a view that state and local action may be increasingly important (Schreurs, 2008; Barber, 2013).

The interplay among levels of government in the US is illustrated nicely in the story of efforts to curb emissions from electric power stations. In 2007, the Supreme Court handed down a decision in a case known as *Massachusetts v. EPA*, initiated by a group of states frustrated by the lack of federal action regarding the problem of climate change, confirming that carbon dioxide (CO₂) is a pollutant under the terms of the Clean Air Act Amendments of 1990. Still, the Federal government did not take steps at the time to address the problem of GHG emissions. Despite congressional deadlock on the issue, the Obama Administration proposed regulations under the Clean Air Act in 2014 that would reduce CO₂ emissions from existing coal-fired power stations, with an anticipated outcome of reducing systemwide CO₂ emissions by 30% relative to 2005 levels by 2030. All states with such power stations will be subject to the provisions of this regulatory initiative. The proposed regulations would build on actions already underway in many states (e.g. renewable portfolio standards, energy efficiency programs, CO₂ emission cap and trade programs) and in the power sector, leaving it to individual states to make their own choices regarding policy instruments to be used within their jurisdictions. A vigorous debate is underway regarding plans to finalize these proposed regulations in 2015. If this process does go forward, it will set up a test of the effectiveness of executive authority with consequences that will extend far beyond the case of climate change.

6. The performance of environmental governance systems

This focus on institutionalized governance processes that are deeply rooted in the historical experiences and in the social and

political institutions of each country can help us not only to understand successes and failures of environmental governance in China and the US but also to identify opportunities for improvement and to devise strategies that make it possible to capitalize on these opportunities in specific issues areas.

6.1. Successes and failures

Both successes and failures in efforts to solve environmental problems occur in each system (Meadowcroft, 2014). It is important to recognize differences between the two societies in assessing the performance of their environmental governance systems. America is a post-industrial society moving away from heavy industry; China is still in the stage of rapid industrialization, although it is already beginning to shift its economy toward higher-value manufacturing and services. Nevertheless, it is not hard to identify successes and failures in each setting.

In some cases, the two countries have coordinated their efforts to pursue common environmental goals. The successful effort to phase out many ozone-depleting substances is an important case in point. During their June 2013 meeting, Presidents Obama and Xi pledged to work together to phase down production and consumption of hydrofluorocarbons (HFCs), which are powerful climate pollutants being used as substitutes for ozone-depleting substances. Equally striking is the agreement announced during President Obama's visit to China in November 2014 that the two countries will coordinate their efforts to deal with GHG emissions and work toward a successful conclusion of a new global agreement at the UNFCCC's COP 21 in Paris at the end of 2015.

In the US, there have been major successes in providing safe drinking water, removing lead from gasoline, improving food safety, reducing emissions of a range of air pollutants including SO₂ and NO_x, reducing black carbon and particulate pollution as well as urban smog, and cleaning up many hazardous waste sites. At the same time, serious problems remain regarding the impacts of agricultural fertilizers and pesticides, the occurrence of algal blooms in large lakes, the spread of dead zones in marine systems, the mining of fossil groundwater, and high per capita emissions of GHGs.

China has achieved successes in reducing SO₂ emissions and COD, ensuring that some of the water flowing in the Yellow River reaches the sea (Wang, 2005), taking steps to improve food security, and reducing energy intensity. On the other hand, rapid industrialization and urbanization have caused serious environmental problems. Air, water, and soil quality remain severe problems, and water shortages are a major problem in some parts of the country. Analysis suggests that air pollution, especially particulate pollution from coal combustion and solid fuel-fired heating, is the fourth leading cause of premature mortality and morbidity in China, resulting in 1.2 million premature deaths in 2010 (Yang, 2013). Despite reductions in energy intensity, total emissions of GHGs have risen rapidly. China now accounts for 27–28% of global carbon dioxide emissions, a proportion that continues to rise (Global Carbon Project, 2014).

6.2. Determinants of effectiveness

What factors determine the extent to which the processes of environmental problem solving prevalent in the two countries succeed or fail? Of course, more research is needed to answer this question. But some initial observations are in order.

Some determinants of effectiveness are common to America and China, though they play out differently in the two systems. Leadership is an important factor in both systems. In America, this may mean the ability to form coalitions needed to produce results in legislative settings. In China, it is more likely to mean the ability

of key individuals (e.g. the president and premier) to set priorities and line up support within the top ranks of the party and relevant interest groups. Implementation—moving plans or laws from paper to practice—is another key factor in both systems. Lower level officials have their own incentives that may further or thwart efforts to implement environmental policies, despite the introduction of procedures (e.g. the Target Responsibility System in China) designed to improve implementation. Corruption is a threat to implementation in both systems. In addition, there are challenges of tracking progress in both systems, so that it is possible to determine when and whether policy initiatives are working. Innovations regarding reliable systems of monitoring and verification are important in both settings.

On the other hand, given the differences between the two systems regarding dominant governance processes, other determinants of effectiveness are specific to one system or the other. In the US, the composition of the judiciary has always been important to the law-centered processes. Today, the polarization that paralyzes federal, and often state, legislative action is also key to the workings of the law-centered processes (Klyza and Sousa, 2008). In China, the assumption that the stability of the existing political order depends on its ability to deliver continued economic growth can act as a barrier to progress regarding environmental issues, although rising popular pressure to address environmental problems appears to be having an impact on public policy (Shapiro, 2012).

6.3. Societal roots and path dependence

The processes we have described are deeply rooted in the political and legal institutions and in the cultures and historical experiences of the two societies. This makes environmental governance in the US and China highly path dependent. A key question, therefore, is whether continued adherence to these paths will allow for solutions to the environmental problems likely to arise in the coming years and decades.

The idea of the centrality of law, inherited from English common law, is deeply rooted in American culture. The role of interest group politics is embedded in the political philosophy of pluralism and in the system of checks and balances established in the US Constitution, which makes legislative bargaining necessary to produce policy innovation under most circumstances. Federalism in America prohibits the direct use of Chinese-style pilot projects, although the Federal government may seek to achieve similar results by offering incentives for local experiments.

Today, many Americans routinely question, from a variety of perspectives, the adequacy of the law-centered processes we have identified to meet emerging challenges. There is a common view that the political institutions that are the focus of the law-centered processes, particularly at the federal level, are not working well.

In commentaries on China's rise and America's gridlock, it is not uncommon to hear prominent observers comparing America's government and market system unfavorably to China's state planning process. Since President Carter, no American president has called for a national plan with regard to energy or the environment; no Congress has taken such ideas seriously. Today, the Obama Administration is seeking to use existing legal authority under the Clean Air Act to take action regarding climate change in the face of opposition from some members of Congress and powerful private interests. Whether EPA regulation within the existing provisions of the Clean Air Act can or will be adequate, and if so, sustained in court, remains to be seen. Similarly, while there is enthusiasm for continued experimentation in states and cities, there are deep questions about the feasibility of scaling up state and local actions to address climate change challenges.

Parallel comments are in order regarding the Chinese system. For millennia, China's central governments have sought to develop and refine means to deal with environmental problems and other governance concerns. Using modern technologies and economic instruments, the central government today is able to enunciate policies in terms of FYPs (and further policy directives) that apply in principle on a systemwide basis. But it remains to be seen whether the core processes we have identified will be capable of solving the environmental problems arising today and in the near future.

As in the US, powerful economic interests continue to oppose restrictions imposed in the name of the environment. Moreover, given the number and complexity of environmental challenges, it is difficult to establish priorities among them and to operationalize these priorities in a useful manner. The 10th FYP may have lost traction by adopting a multiplicity of environmental targets; the 11th FYP may have succeeded because it focused more narrowly on a few (e.g. SO₂ and COD) (Schreifels et al., 2012).

A comparison with the American system of environmental governance suggests several questions. China now has many environmental laws. But in moving from the letter of the law to practice, where will law(s) fit into the plan(s) and other rule sets employed by the Chinese government (He et al., 2013)? Will the planning process, with its temporal qualities rooted in the Chinese party and personnel systems, be able to address the complexities of the environmental challenges arising in China today? How will the resources that nongovernmental actors might bring to bear on identifying environmental challenges and assisting government in implementing policies be harnessed?

7. Extensions and corollaries

Our central argument regarding the role of institutionalized governance processes is complete. But in this final substantive section, we extend our analysis to what we described in an early section of this article as third governance processes and to the identification of a corollary to our argument relating to what analysts commonly describe as policy instruments.

7.1. Third governance processes

In the US, nongovernmental actors play important roles in bringing issues to public attention, in catalyzing legislative or regulatory responses, in exploring the advantages and disadvantages of various policy instruments, and in oversight of their implementation including through the actions of courts. In China, citizen protests may trigger governmental concern and response, but the mechanisms for public participation are not as well developed, at least at this stage. Still, the role of government remains key to all these processes in both China and the US.

What are the prospects for the rise of alternative governance processes in which non-governmental forces play a more central role? Is there a common need for third processes? At issue here is whether there is a role for governance processes in America and China in which governments or public agencies are either not involved at all or play subordinate roles, acknowledging and perhaps ratifying solutions that emerge from nongovernmental processes. In America, for example, the anti-smoking movement brought about profound changes in both norms and behavior independent of legislative or judicial action. Are such processes significant in finding solutions to environmental problems? Are they specific to the American cultural setting?

One example of a third process involves the history and continued possibility of self-regulation on the part of nongovernmental actors. For example, the private insurance industry (in the US and elsewhere) has played a role in driving a concern for

industrial safety by identifying future risks that enterprises might be liable for, and conditioning insurance on a requirement that enterprises take action to mitigate such risks. Government plays a supporting role in insurance, of course, providing the backbone of "law" institutions, including courts to enforce contracts. But we argue that such nongovernmental regulation differs from late 20th century market-based regulation, such as cap-and-trade arrangements, in which governments play a more central role in creating the markets and setting market rules (Haufler, 1997; Delmas and Young, 2009).

A second example highlights cultural or lifestyle changes, perhaps related to education and the availability of information, that are responsive to acute environmental realities. In China, pollution levels now appear to be affecting basic life choices: what city to locate in, where to raise children and send them to school, where to buy food, and what kinds of economic development to welcome into the neighborhood (Wong, 2013; Aitken, 2014).

Technological changes provide a third example. Renewable energy technologies and altered industrial processes occupy prominent places in economic development in the US and China. In both countries, there has been a close connection between the development of these technologies and efforts to address environmental problems. Government interventions in the forms of subsidies, taxes, or other incentives have played an important role in both countries. But in some cases, at least, the drivers of technological advances are nongovernmental actors. Greenpeace, for example, pioneered refrigerators free of fluorinated gases that deplete the ozone layer and contribute to climate change.

These third governance processes play some role in dealing with environmental issues in both America and China. But we argue that they are less important in addressing environmental problems than they are in coming to terms with issues in other domains.

In the US, the environmental movement has favored a strategy of seeking to induce governments to make use of law-centered approaches to deal with environmental problems. We do not (yet) see environmental counterparts to the successes of the women's suffrage movement, the civil rights movement, or the gay rights movement. A partial exception in America may be the animal rights movement. But even this case illustrates the limited impact of such third processes in addressing environmental problems. In China, on the other hand, both the political culture and the current political system are not conducive to the development of effective social movements. While the government is sometimes responsive to crises fueled by public concern over the effects of natural disasters or the health implications of pollutants, officials work hard to put barriers in the way of efforts to instigate effective social movements to address societal concerns.

It may be as well that the nature of (some) environmental issues makes them difficult to address through non-governmental processes. Some issues, such as climate change, are unrelated to the day-to-day concerns of life, leave individuals without a sense of personal efficacy, and are easily displaced by more immediate concerns. In many cases, environmental issues involve the production of public or collective goods, a fact that encourages many (perhaps most) people to behave as free riders hoping that others will take the steps needed to address the problem. As close observers have noted, there are relatively few cases of significant social movements that are inspired by international problems and that transcend the boundaries of individual societies.

Could this situation change in the future? Despite the force of path dependence, neither the Chinese nor the American political system is immune to change. Especially in cases where transgressing planetary boundaries may lead to dramatic crises in the future (Rockström et al., 2009), the dominant governance processes may become discredited, opening up opportunities for third processes

to flourish. Climate change is undoubtedly a leading candidate as an issue that could precipitate such changes in both countries (Klein, 2014).

7.2. Policy instruments for environmental governance

Both countries employ a variety of policy instruments or tools (e.g. taxes, subsidies, permits, command-and-control regulations) in efforts to achieve the goals/targets set forth in laws and plans. Many analyses of environmental governance focus on the details of specific policy instruments on the assumption that the choice of the right instrument is critical to the success of policy initiatives. There is some logic to this argument. But in our view, policy instruments are subordinate to institutionalized governance processes. In most situations, more than one policy instrument can do the job, and the choice of specific instruments is apt to be dictated by the prevailing governance process rather than the other way around.

If our argument about the central role of institutionalized governance processes is correct, we would expect to find (i) some policy instruments in the two systems that bear the same name but work differently because of divergences in the underlying governance processes and (ii) some tools that are important in one system but have no clear analog in the other system. As a Chinese saying puts it, changes often occur when “seeds from fruit on one side of the river are transplanted on the other.”

Consider the case of experiments and pilot projects as an example of the first of these propositions. Chinese governance processes often rely on the launching of pilot projects in selected provinces and cities, learning from the results of these experiments, and scaling up successful experiences (Schreurs, 2008). In the late 20th century, centrally sanctioned local experimentation, including the launching of “special economic zones” and “household production responsibility systems,” was key to the remarkable “opening up and reform” strategy of economic development (Heilmann, 2008; Shirk, 1993; Oi, 1999; Fewsmith, 2013). In the 21st century, pilot or experimental projects have been features of the processes of environmental governance. In the first decade of the century, experiments or pilots included “low carbon development pilots” and emissions trading pilots. The focus of the current 12th FYP on low carbon development has been accompanied by experiments in low carbon urban development and emissions trading (Zhu et al., 2014). While local governments may be proactive in competing for designation as a pilot, the process is ultimately under the control of the central government.

In the US, local pilots or experiments are also common. But the practice differs from the parallel practice in China in several important respects. In China, experimentation/learning and scaling up are usually under the control of the central government. Provinces and cities may compete to become pilots, but the central government decides on the location of pilot projects, takes the lead in evaluating the results, and makes decisions regarding which initiatives are ready to be scaled up for broader application. In America, state and local governments have the authority to make their own choices in this realm. The Federal government may try to guide this process through the use of subsidies or other incentives. But the fact that state and local governments have the authority to make their own decisions about such matters means that a variety of ideas about ways to solve specific problems often surface in state and local settings.

Whether or not these state and local initiatives spread to other jurisdictions is a matter of policy diffusion rather than management on the part of the Federal government. In some cases, the influence of a particularly large state (e.g. California) is sufficient to persuade other states or private enterprises to follow its lead. In other cases (e.g. health care legislation), the Federal government

may decide to model national legislation on arrangements already tried out at the state level. But there is no guarantee or even expectation that these diffusion mechanisms will come into play.

Turning to our second point regarding policy instruments, consider these examples. In China, government imposed caps are applied to otherwise permissible or encouraged conduct on the part of individuals, whereas parallel government imposition of limits on individuals would be unacceptable in the US. These caps include the one child policy most prominently (Greenhalgh, 2008), but also ongoing limits on car ownership (and, though not immediately related to the environment, on home ownership), and the newly announced cap on coal consumption. In the case of limits on enterprises, the idea of cap-and-trade is a hallmark of market-based environmental regulation in the US. China also has been experimenting with emissions trading in its planned experimentation process (Bachus and Cao, 2013). But it is by no means clear whether caps on the activities of enterprises in the context of China’s planned experimentation, where many prime polluters are state owned, have the same practical meaning as market-based regulation in America.

The American system is law centric. Legislation passed by Congress and signed by the President initiates an elaborate process of formulating and promulgating regulations whose application and adequacy are often contested in courts. While China has many environmental laws, the state planning process is central and even dominant when it comes to the allocation of resources and the evaluation of performance. There are as well many other “rules” in China that have no direct analogs in the US system. In addition to laws (as designated in the *li fa fa* or Law on Laws) and plans, for example, formal (i.e. written) leadership directives on which both government officials and those outside of government may act include red-headed documents (*hong tou wen jian*), documents bearing a leader’s sign off (*pishi orpizhun*), and documents that might be characterized in English as opinions/suggestions (*jianyi*).

8. What to look for in the future

Given the argument we have presented, there is no reason to expect convergence in the environmental governance systems operating in China and the US. Many accounts sow confusion in this regard. This is the case regarding both what we have termed the dominant governance processes in each country and the ways in which policy instruments are brought to bear to achieve goals or targets prioritized in the two systems. In China, for example, there are systems of emissions permits intended to control water and air pollution and pilots featuring tradable emissions permits for GHG emissions, developments that suggest a move in the direction of American initiatives intended to address problems of pollution through the creation of quasi-markets (e.g. the US Acid Rain Program, the Regional Greenhouse Gas Initiative, and California’s GHG cap-and-trade system). In our judgment, however, Chinese initiatives involving emissions permits and similar innovations regarding policy instruments differ in fundamental ways from parallel initiatives in America, despite the use of similar terminology.

Developments during the fall of 2014 have brought the issues we discuss in this article to the forefront of efforts to address high profile environmental problems (e.g. climate change) in both countries.

In November 2014, Presidents Obama and Xi announced a Sino-American agreement regarding emissions of GHGs. China plans to reach peak emissions by around 2030. In related policy measures (not yet adopted formally by the National People’s Congress), the leadership has taken steps to impose a cap on coal consumption and to pursue a target of achieving 20% of electricity production from renewable sources by 2030. When the National People’s Congress approves these measures, they will be treated as (legally) binding or having “legal effect” (*fa lu xiao li*). Given China’s top-down approach to implementation, these measures will be taken seriously. But

practical questions regarding both scientific and technological capacity and pressures to achieve competing goals will be critical determinants of their ultimate success. The Obama Administration, for its part, has pledged to reduce GHG emissions by 26–28% relative to 2005 levels by 2025. But there is little prospect that the US Congress will enact legislation formalizing such a target in law. This means that the administration will be forced to rely largely on executive initiatives justified on the basis of existing statutory authority as a means of pursuing this goal.

In China, these developments are unfolding in the context of the results of the CPC's October 2014 Fourth Plenum of the Eighteenth Congress focusing on the rule of law. In a roadmap document issued at the end of the plenum, the leadership announced a commitment to the integration of "law" and "policy" (including plans) (Communist Party of China, 2014). If this initiative is pursued effectively with regard to reaching peak emissions around 2030, the coal cap, and the 20% renewable electricity target along with related targets to be included in the 13th FYP that will come on stream in 2016, it will have implications for the dominant process of state planning. But what is the significance of this development? Law is not unimportant in the Chinese system, but what we can expect is an overlay of the rule of law with Chinese characteristics in conjunction with the existing governance process emphasizing state planning.

Some may see these developments as an indication that environmental governance in China is shifting toward a law-centered process, while the US is finding it increasingly difficult to employ such practices effectively in addressing environmental issues. This is certainly a possibility; it is important not to overestimate the power of path dependence. In our view, however, these developments reinforce the need to understand the institutionalized processes of environmental governance in place in the two systems in their own terms, avoiding the confusion arising from descriptions of each system using terminology associated with the other. In the final analysis, success in solving environmental problems in China will occur when strong leadership produces joint initiatives on the part of the CPC and the National People's Congress that lead to effective top-down pressures on lower levels of government responsible for achieving the targets articulated in FYPs. While executive initiatives based on existing authority may suffice to address some environmental problems in the US, lasting progress in dealing with major issues like climate change almost certainly will require coordinated action on the part of the legislative and executive branches of government.

The way forward is to work within the established governance processes in each country, but, in doing so, to make use of a comparative lens that helps us to understand their limits and the potential for introducing adjustments that may be needed in both countries as we confront the increasingly challenging environmental problems of the 21st century (Steinberg and VanDeveer, 2012; Duit, 2014). There may be lessons to be drawn from the experiences of one society that are useful to those seeking to solve analogous problems in other societies. But this sort of reasoning is always hazardous. We are convinced that it is essential to identify the determinants of success and failure in the operation of specific institutionalized governance processes and to consider opportunities to maximize the effectiveness of each process in its own terms, rather than to make general pronouncements about the (un)desirability of these processes based on superficial comparisons across distinct social and political settings.

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